## AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph bridging page 6 and page 7 and the next paragraph on page 7, with the following amended paragraphs:

Referring now to **Figure 1**, wherein a block diagram illustrating an overview of the present invention, in accordance with one embodiment is shown. As illustrated, in accordance with one aspect of the present invention, data sender system **102** is advantageously provided with data transmitter **108** of the present invention, to assist a data sending application, such as data sender **104**, to transmit semi-structured data structures, such as XML data structures, as represented by data structures **106**, in a more efficient, compact, and bandwidth reduced manner. As will be described in more detail below, data transmitter **108** effectuates transmission of data structures **106** in the desired manner, by transmitting occurrence frequency based cookie representations of the "tokens", i.e. data elements, of data structures **106** instead. For the illustrated embodiment, the novel transmission of the occurrence frequency based cookie ~~reprensentations~~representations are performed, ~~employini~~employing dictionary **110** and array **112**. As will be described in more detail below, dictionary **110** is employed to store the occurrence frequency based cookie representations for encoding the "tokens", whereas array **112** is used to store the encoded "tokens", i.e. their cookie representations.

In accordance with another aspect of the present invention, data receiver system **114** is advantageously provided with ~~complementarilty~~complementarily equipped data receiver **116** to assist the ultimate data recipient **118** in receiving data structure **106** transmitted in the

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above described efficient manner. For the illustrated embodiment, data receiver 116

effectuates the assistance employing dictionary 110', which as will be described in more

detail beliowbelow, is provided by data transmitter 108.

Please replace the paragraph on page 8 starting on line 16, with the following amended

paragraph:

Similarly, while for ease of understanding, the present invention will be described

referencing XML data structures and examples expressed in XML, those skilled in the art

would appreciate that the present invention may also be practiced on other data

streuturesstructures, including but are not limited to HTML or WML encoded contents.

Please replace the paragraph bridging page 8 and page 9, with the following amended

paragraph:

Referring now to **Figures 2a-2b**, wherein two block diagrams illustrating the novel

data sending and receiving method of the present invention in further detail, in accordance

with one embodiment, are shown. As illustrated in **Fig. 2a**, at block 202, data sender 104

"transparently" sends constituting elements of data structure 106 (such as tag names, attribute

names, and attribute values, in the case of an XML structure) in plain text, as in the prior art.

That is, legacy data sender 104 may continue to send data as in the prior art without having to

make any adjustments to its operation, nor having to be congnizantcognizant of the practice

of the present invention. However, in alternate embodiments, data sender 104 who's-who is

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cognizant of the present invention, may further take advantage by sending the data elements

of data streuturestructure 106 in token form. In accordance with the present invention, the

data elements are received by data transmitter 108 and turn into token form if received in the

plain text form. Data transmitter 108 would parse the received data streuturestructure 106 to

"tokenize" its data elements, using any one of a number of parsing techniques known in the

art. Using example "Employees" XML data structure 400 illustrated in Fig. 4a as an

example, as the constituting elements of example structure 400, i.e. "<", "Employees", ">",

and so forth, are sent "transparently" by data sender 104, data transmitter 108 receives the

constituting elements as "tokens", as illustrated in **Fig. 4b.**

Please replace the three paragraphs starting on page 11, line 4 with the following

amended paragraphs:

~~Thereafer~~Thereafter, at block 208, data transmitter 108 transmits the "tokens" in their

encoded representative form. In one embodiment, data transmitter 108 transmits the tokens

(implicitly conveying their encodings), and the encoded representations as one contiguous

string or stream (to be described more fully below). At block 210, upon receipt of the list of

unique tokens (and their encodings), and the encoded representations, data receiver 116

reconstitutes the original data structure, i.e. regenerating the original data elements based on

the received encoding representations and the unique tokens (and their corresponding

encoding representations), for ultimate data recipient 118. As a result, the amount of

processing required on the receiver side to accept the transmitted data structure is also

significantly reduced. Further, by remapping the tokens back to the original data elements,

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the method may be made transparent to legacy data receivers. However, in alternate embodiments, data recipients 118 cognizant of data receivers 116 may further take advantage of the present invention, and reduces its storage employed to store received data streuturesstructures by having data recieverreceiver 116 provides the received data structure in the token form, without reconstituting the original data elements.

Figure 2b illustrates the encoding operation of block 204 in further details, in accordance with one embodiment. As illustrated, at blocks 222 and 224, data transmitter 108 first encodes the tokens with an initial encoding as the tokens are received/identified, and stores the received/identified tokens in their representative form. Additionally, data transmitter 108 tracks each of the unique tokens encountered, its initial encoding, and more importantly, the occurrence frequency of each of the unqiueunique tokens. For the illustrated embodiment, the intialinitial encoding is simply the order the unique tokens are encountered. For example, for the example "Employee" XML data structure 400 of Fig. 4a, the initial encoding employed is as illustrated in Fig. 4c. That is, token "<" is encoded with the numeric cookie representation of "0", as it is encountered first, token "Employees" is encoded with the numeric cookie represenationrepresentation of "1", as it is encountered next, and so forth. Thus, example "Employee" XML data structure 400 may be stored in a representative form in array 430a (corresponding to array 112 of Fig. 1) as illustrated in Fig. 4d.

Thus, upon receipt of all tokens, i.e. data elements of the data structure being transmitted, the occurrence frequneiesfrequencies of the unique tokens of the data structure would be established. For the example XML data streuturestructure 400, it would have

established that token "<" occurs 4 times, token "Employees" occurs once, token ">" occurs

8 times (the most frequent), and so forth, as illustrated in Fig. 4c.

Please replace the first paragraph on page 13 with the following amended paragraph:

Thus, it can be seen that the encoding or compression operations of the present

invention may be performed in a relatively straight forward manner, with relative low

memory and processing requirements.  As a result, the amount of memory and

~~processing~~processing required on the sender side to "compress" the data elements for

transmission (to achieve the desired bandwidth consumption reduction), under the present

invention, is also ~~advanageously~~advantageously smaller than other compression techniques

known in the art, such as "Zip".

Please replace the paragraph bridging page 13 and page 14 with the following

amended paragraph:

**Figures 3a-3c** illustrate a number of example data structures suitable for use to

practice the present invention, in accordance with one embodiment.  Shown in **Figure 3a** is

example table **300** having at least three columns **302-306**, suitable for use by data transmitter

**108** to store the cookie representations (initial as well as final for the earlier described two

steps embodiment), the represented tokens, and their occurrence frequencies.  An abridged

version of example table **300**, without column **306** may be used by data receiver **116** to store

the cookie representations, and the represented unique tokens.  Shown in **Figure 3b** is

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example array **310** having a number storage slots suitable for use by data transmitter **108** to stored the encoded representations (c0, c1, c2 etc.) of the tokens of a data structure being transmitted. Shown in **Figure 3c** is example string or stream **320** having two sections **322** and **326**, separated by delimiters **324a-324b**, suitable for use by data transmitter **108** to transmit the unique tokens (and implicitly convey their encoding representations), and the encoded ~~representaions~~representations of the tokens of a data structure being transmitted. For the illustrated embodiment, first section **322** is employed to transmit the unique tokens (and implicitly convey their encoding representations). Each unique token is preceded by the token size. For example, the token "<" is preceded by the token size value of "0x01", the token "</" is preceded by the token size "0x02", and so forth (as illustrated in **Fig. 4g**). The encoding representation for the token "<" is "1", as implied by the fact that the token is transmitted in the first transmission position, the encoding representation for the token "</" is "3", as implied by the fact that the token is transmitted in the third transmission position, and forth. Referring back to **Fig. 3c**, as illustrated, second section **326** is employed to transmit the encoded representations of the tokens of the data structure being transmitted.